HUD, STATE OF ALASKA & AK REGIONAL HOUSING AUTHORITIES

| AN ENERGY EFFICIENCY PARTNERSHIP SUCCESS STORY

April 29, 2014

Presented by:
Dan Duame, Executive Director
Aleutian Housing Authority

Alaska Native Regional Housing Authority Overview

- 14 RHA's
- Created in the early 1970's under Title 18 of Alaska Statues

Alaska Native Regional Housing Authority Overview

Major conduit for federal, state & private affordable housing funding & services

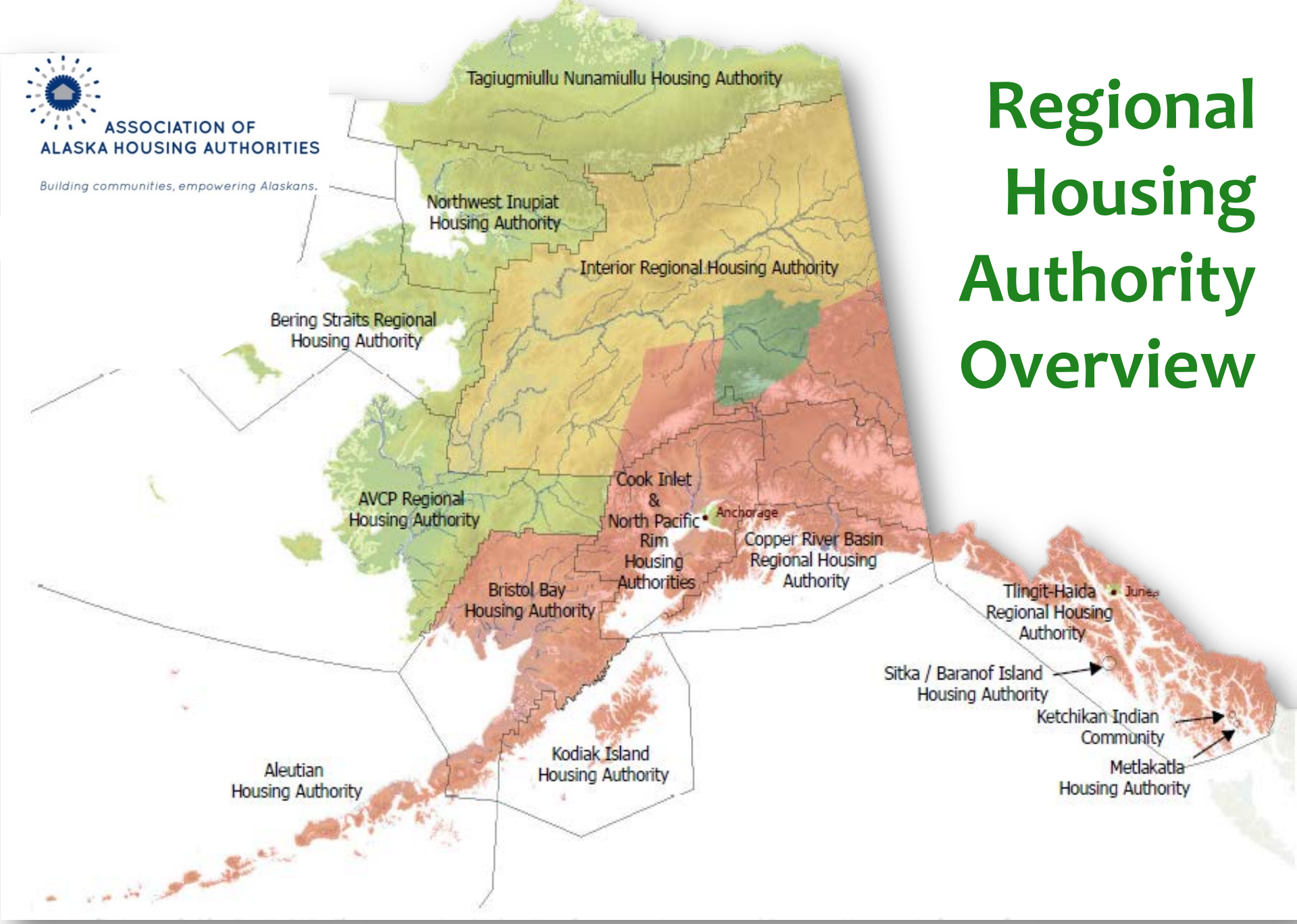
Alaska Native Regional Housing Authority Overview

- 51 NAHASDA Recipients
  - 14 Regional Housing Authorities (TDHE's)
    194 Tribes
  - 37 Individual Tribal Recipients
- Total Alaska NAHASDA Allocation = $91, 656, 892
  - RHA's = $77,501,997
  - ITR = $14,154,895

ASSOCIATION OF ALASKA HOUSING AUTHORITIES

Building communities, empowering Alaskans.

Regional Housing Authority Overview



Alaska Native Regional Housing Authority Overview

12,000 new homes since 1971

New SFH |Unalaska, Alaska

2012 RHA operations resulted in:

- Energy efficient homes: 190
- Homes weatherized: 1,220
- Homes rehabilitated: 740
- Housing units managed: 4,100

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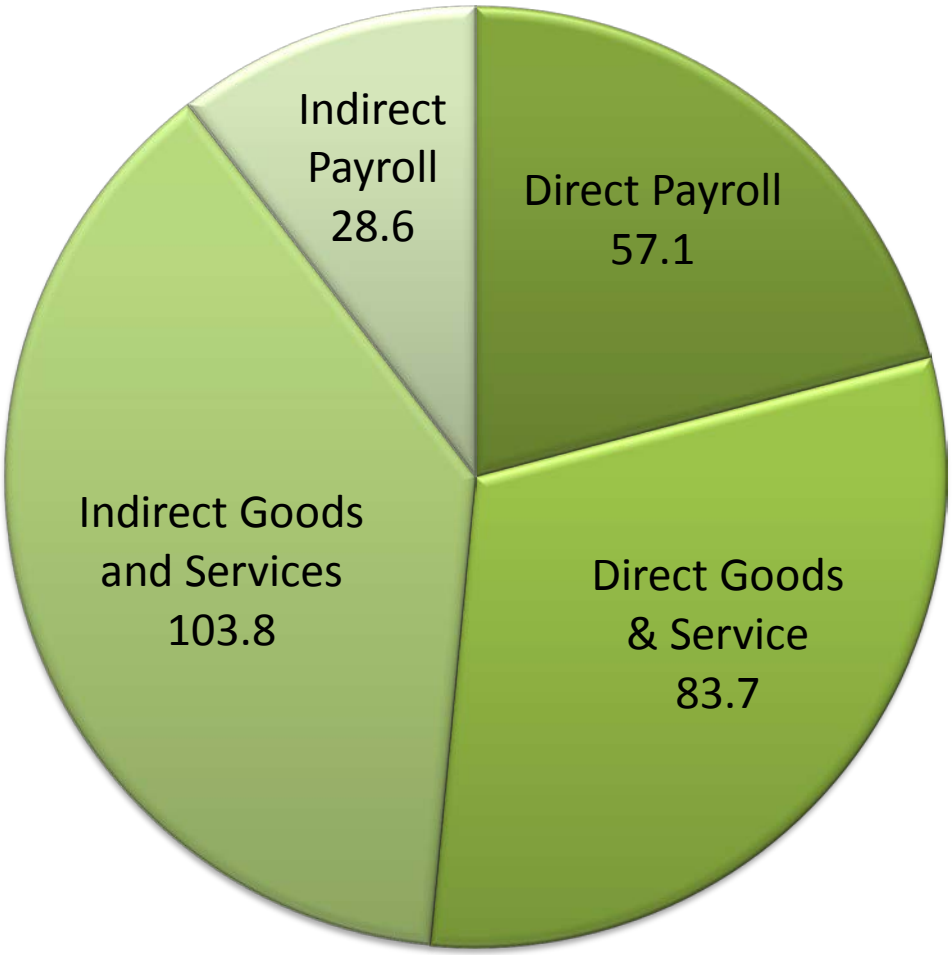
In 2012, RHAs generated **$273 million** in economic activity and **2,240** jobs for Alaskans.

$99 million **invested** in construction, home improvement and acquisition



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Funding Sources

Three significant sources of funding for improving energy efficiency:

1. NAHASDA | federal
2. Supplemental Housing Grant Program | state
3. Weatherization | state

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AHFC SUPPLEMENTAL HOUSING DEVELOPMENT GRANT

Alaska Housing
FINANCE CORPORATION

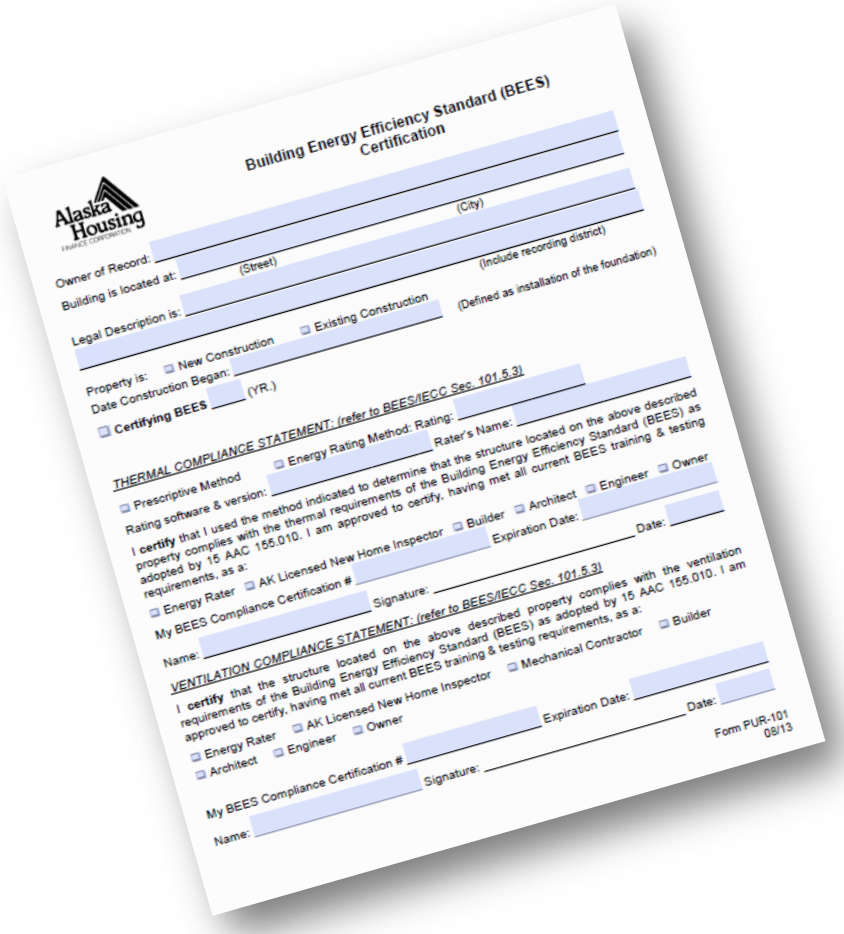
AHFC SUPPLEMENTAL HOUSING GRANT

Purpose

Provides a **20%** match to federal HUD funds for:

- **Energy efficient design features**
- **On-site water & sewer facilities;**
- **Roads to project sites; and**
- **Electrical distribution systems**

Requires adherence to State BEES standards



Alaska Housing FINANCE CORPORATION

Building Energy Efficiency Standard (BEES) Certification

Owner of Record:

Building is located at: (Street) (City)

Legal Description: (Include recording district)

Property is: ☐ New Construction ☐ Existing Construction (Defined as installation of the foundation)

Date Construction Began: (YR.)

☐ **Certifying BEES**

THERMAL COMPLIANCE STATEMENT: *(refer to BEES/IECC Sec. 101.5.3)*

☐ Prescriptive Method ☐ Energy Rating Method: Rating:

Rating software & version: Rater's Name:

I **certify** that I used the method indicated to determine that the structure located on the above described property complies with the thermal requirements of the Building Energy Efficiency Standard (BEES) as adopted by 15 AAC 155.010. I am approved to certify, having met all current BEES training & testing requirements, as a:

☐ Energy Rater ☐ AK Licensed New Home Inspector ☐ Builder ☐ Architect ☐ Engineer ☐ Owner

My BEES Compliance Certification # Expiration Date: Date:

Name: Signature:

VENTILATION COMPLIANCE STATEMENT: *(refer to BEES/IECC Sec. 101.5.3)*

I **certify** that the structure located on the above described property complies with the ventilation requirements of the Building Energy Efficiency Standard (BEES) as adopted by 15 AAC 155.010. I am approved to certify, having met all current BEES training & testing requirements, as a:

☐ Energy Rater ☐ AK Licensed New Home Inspector ☐ Mechanical Contractor ☐ Builder

☐ Architect ☐ Engineer ☐ Owner

My BEES Compliance Certification # Expiration Date: Date:

Name: Signature:

Form PUR-101 08/13

No other required energy efficiency or building code standards in most of rural Alaska

Alaska Housing FINANCE CORPORATION

Funding History

Since 1993: High (2012): $11 M
Low (2000): $3.8 M
2014: $7 M

Results: Construction and rehabilitation of **11,700 units** in over **250 communities**

Alaska Housing Finance Corporation

Association of Alaska Housing Authorities
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AHFC SUPPLEMENTAL HOUSING GRANT

FY 2011-2013

AVCP Supplemental Grant Expenditures: $8,827,559 (92 Units)

AHA Supplemental Grant Expenditures: $1,211,807 (103 Units)

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WEATHERIZATION

Alaska Housing
FINANCE CORPORATION

Total projected Weatherized Units through March 31, 2014: 13,500

Savings

- Average saving in **ENERGY** costs
- Low 20%(ANC) High 40% (AHA/NANA)

Savings

- Average annual **HEATING FUEL** savings
- 19.8 million gallons

Savings

- Average **STATEWIDE** dollar savings
- $46 million

RHA Weatherization Activity

2012

Weatherization Contracts

Contracts $22.6 million

Weatherization Activity

Units: 1220

Weatherization Workforce*

Trained Workforce : 1145

*highly specialized

Why is this Investment Important?

Alaskans burdened with significantly higher energy costs than rest of the US

Why is this Investment Important?

Alaska homes use **Twice** the total amount used as other homes classified as "cold / very cold climates"

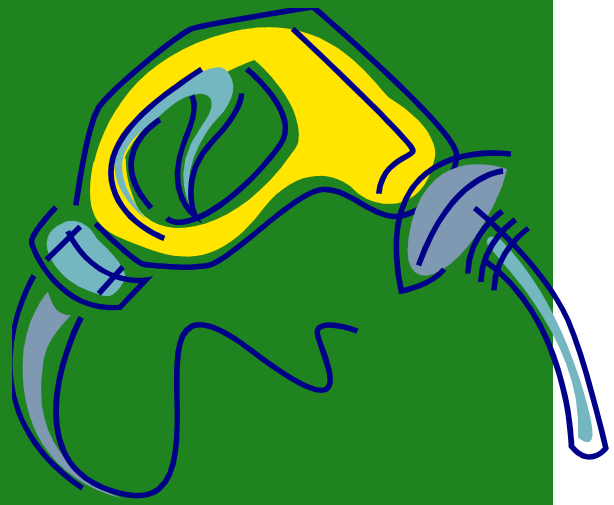
Why is this Investment Important?

3 times the energy / sq. ft.

NANA region = $9.15 / sq. ft. (9x)

Average US = $.97

Why is this Investment Important?



Fuel price

Average in Alaska: $5.86

National average = $3.98

[$5.83 (SE) - $10.00 (Interior)]

Rural average much higher

Why is this Investment Important?

AK ranks **47th** in the 2013 State Energy Efficiency Scorecard produced by the American Council for an Energy-Efficient Economy

Why is this Investment Important?

19,810

Alaska homes (8% of occupied housing)

estimated to be

one-star rated

Why is this Investment Important?

Weatherization of **existing** infrastructure

= greatest possible ROI and benefit to AK's most needy population.

AHA Regional WX Activity

ATKA

- 1,100 miles from Anchorage
- 4.5 hour flight
- (RT) Airfare - $1750
- Heating fuel - $7.65 per gallon
- Electricity - $.75 per kwh
- Barge service 2 to 3 times per year

ATKA Post Weatherization

Average Client Savings 42%

WX Client No.	Annual Fuel Saving in gallons	Annual Cost Savings
15	302	$3,106.60
13	455	$4,052.00
6	675	$6,018.00
2	580	$5,372.00
11	425	$3,883.65
10	550	$4,811.00
8	266	$2,631.09
7	203	$2,224.86
6	275	$2,822.00
Total	**3,731**	**$34,921.20**
Average	**415**	**$3,880.13**

" My fuel cost was cut nearly in half. When you pay an upward of $8 dollars a gallon, this is significant. Prior to weatherization I would use roughly 800 to 900 gallons of fuel a year. "

Sarah Golodoff

ALEUTIAN
HOUSING AUTHORITY

Past & Present

AHA

Doing **great work** all across our region **but** Can we do **even** better?

Performance &Cost?

AHA | Looking to the Future

Innovation

We are always seeking continuous improvement.

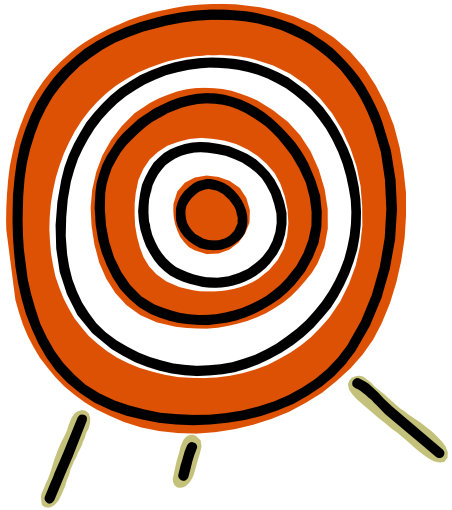
We are never afraid to question the status quo.

LIVING ALEUTIAN HOME DESIGN COMPETITION

COMPETITION

SUMMARY

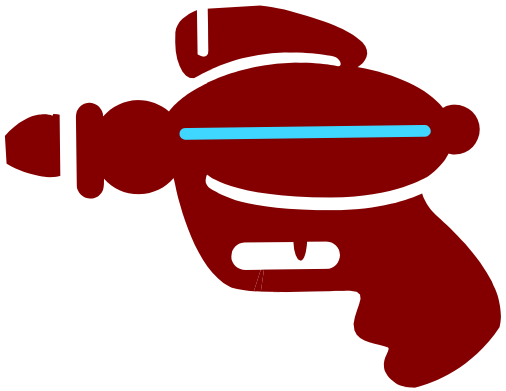
We learned a lot …



COMPETITION

SUMMARY

No Magic Bullet



COMPETITION

SUMMARY

Process evolved into

Three on-going projects / activities

COMPETITION

SUMMARY

- Octagon Model (Designed to be “net-zero energy”)
- Stabilized-insulated Rammed Earth Model
- Optimization (of existing model)

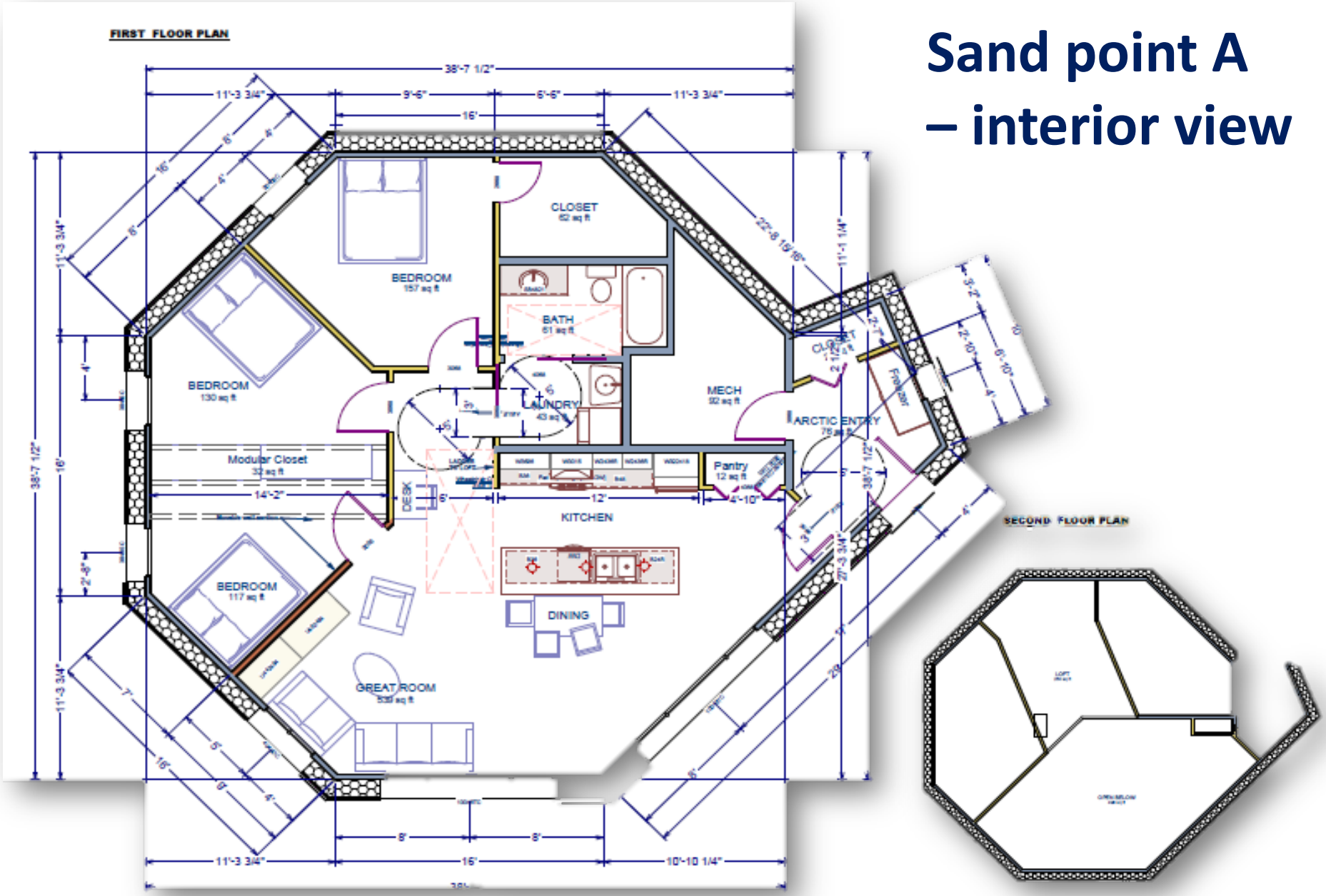
Sand point A – Rendition

OCTAGON

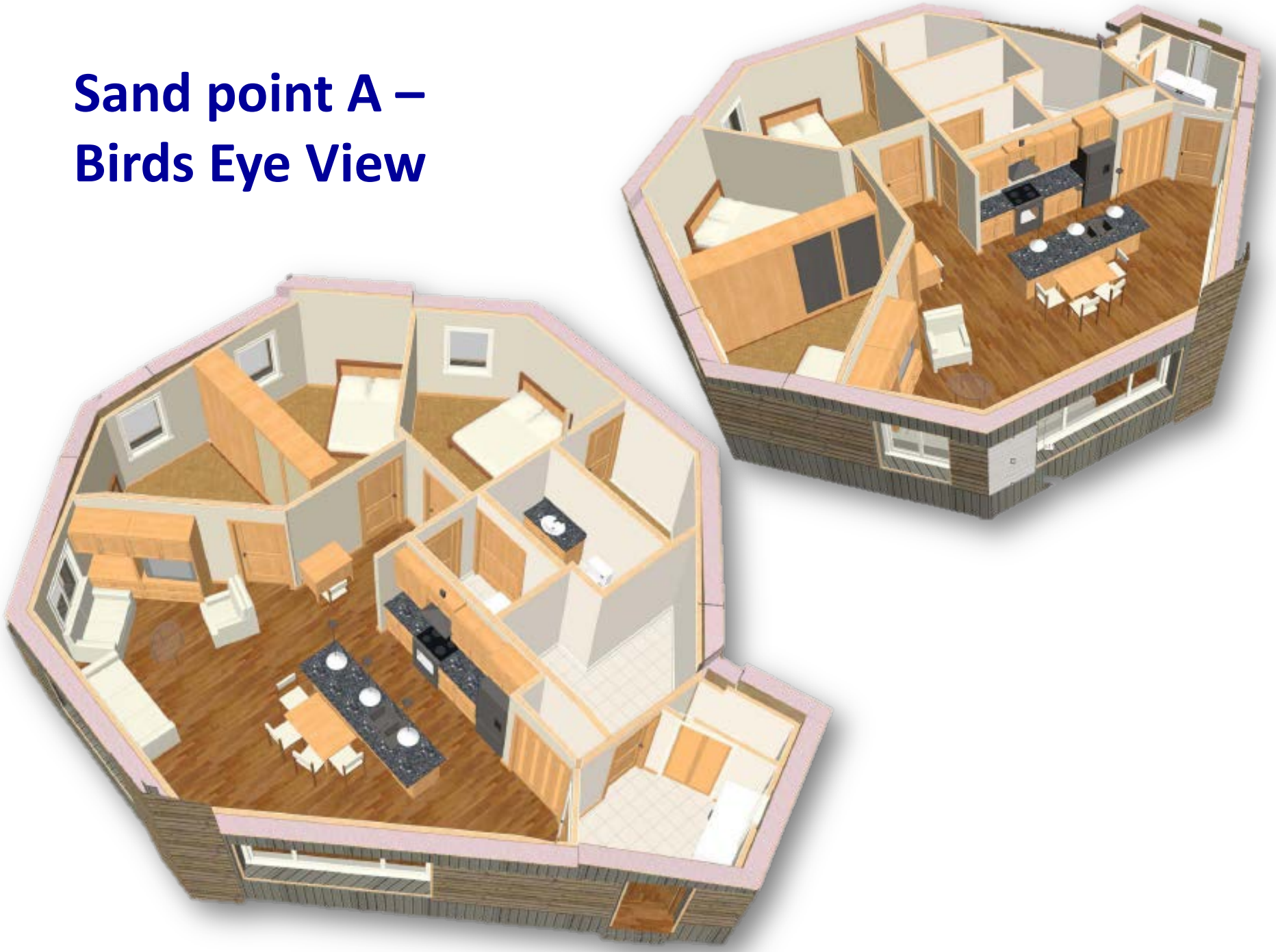
PROTOTYPE

- Designed for Net-Zero Energy
- Ventera VT10-240 – 10Kw Turbine
- 1000 Gal Thermal Storage Tank
- Double-wall 2x4 Construction: Blown Fiberglass Insulation

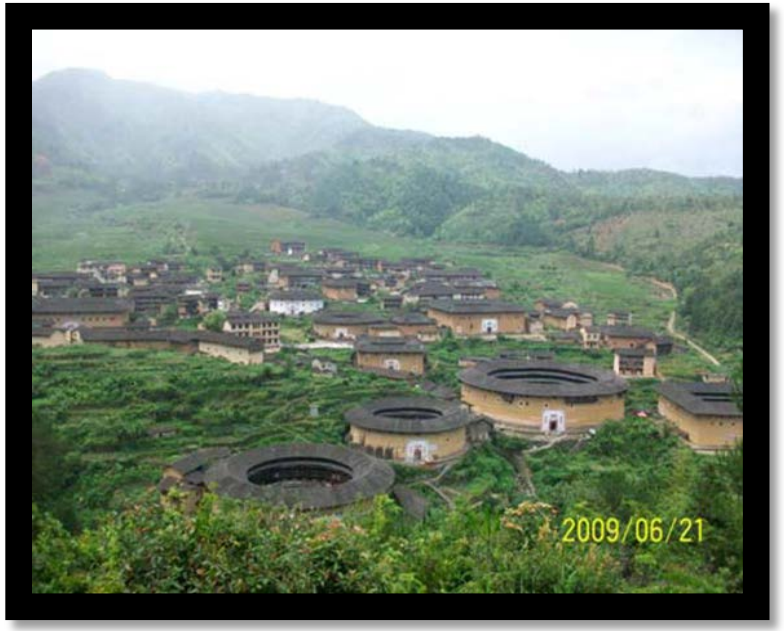
Sand point A – interior view



Sand point A – Birds Eye View



Looking to the Future: The Ultimate in Sustainable Housing Stabilized-Insulated Rammed Earth



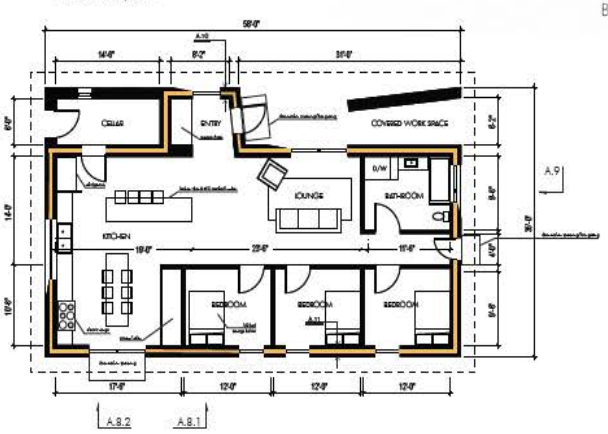
LIVING ALEUTIAN HOME DESIGN COMPETITION

Earth Dwell LTD. + RMH Design

Sloping gently towards the south and the adjacent hillside the Aleutian Earth House is a simple shed form with a sod roof that blends the structure with the surrounding landscape, offers habitat for migratory birds, and provides additional thermal insulation. The thick earthen walls, erected from on-island subsoil, meld the structure into the landscape. The shifting lines of color reflect the variation in the subterranean strata and the presence of iron oxides found within the earth. The entire structure appears as though it emerged from the earth to facilitate the living experience of the inhabitants. The design is guided by the necessity to shelter, provide and inspire. The green roof provides multiple environmental benefits which extend beyond the structure and site; it will remove particulates from the atmosphere and act as a bio filter for the rainwater, before storage for uses on the site..

Modern stabilized-insulated rammed earth walls are very durable, thermally efficient, non-toxic, and eliminate the necessity for any other wall materials. Once the walls are stripped of the forms they are complete. There is no need for exterior siding, interior sheetrock, or paint. Electrical conduit and air ducts placed in the walls during construction allow for clean simple walls to surround the inhabitants. The wall finish is a reflection of the local soils and the ramming process. Using an abundant local material reduces the shipping cost for the project, offsetting the greater labor costs associated with rammed earth construction.

Rammed Earth Model



ALEUTIAN HOUSING AUTHORITY

INTERNATIONAL LIVING FUTURE INSTITUTE

Rammed Earth

Prototype

PRO'S

- Potential use of local materials
- Two wall elements instead of 8-9 for most if not all structural elements
- Construct the walls with a single process & walls are complete (possible exterior sealant)

Rammed Earth

Prototype

CON'S

- Labor intensive;
- Materials may not be available
- Specialized skills

Rammed Earth

Prototype

HUD "**Sustainable Construction in Indian Country**" Small Grant Program

AHA received **$100K** for "Stabilized Rammed Earth Demonstration & Technology Dissemination Project."

SCIC Grant

Purpose

Will conduct structural & energy **efficiency** performance research in partnership with West Virginia University – Constructed Facilities Center

AHA conducting PHPP12*

"optimization" modeling & analysis on existing and prototype models

("Passive House Planning Package" v.12)

Additional

Strategies

Strategies

Moving towards implementing

“PH Standards“

on all projects

Focus on

1. Quality (energy efficiencies /life cycle costs) over Quantity
2. End User Cost over TDC

Strategies

RHA ACTIVITY

- Kodiak – Solar Thermal
- CIHA – Solar Thermal (Eagle River Project
- THRHA – Ketchikan Heat Pumps / Wood Pellets
- AVCP – Interior Value Engineering
- NWIHA – Cold Climate/ HUD (ICDBG) Project

Thank you!

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| **AN ENERGY EFFICIENCY PARTNERSHIP SUCCESS STORY**
April 29, 2014

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ALEUTIAN
HOUSING AUTHORITY
Celebrating 35 Years of Service